SONY

COLOR CAMERA MODULE

FCB-IX47/IX47P
FCB-IX470/IX470P

Instruction Manual

(Ver. 1.01) —English—

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OUTLINE

The FCB-IX47/P and FCB-IX470/P are color camera modules which incorporate an 18× optical zoom lens, a 4× digital zoom and a 1/4" Super HAD CCDTM.
Including a field memory, the FCB-IX47/P and FCB-IX470/P can, in addition to normal video mode, continuously output a frozen picture, achieve slow speed shuttering with increased sensitivity, achieve mirror inversion and allow various 'Picture Effects' and 'Digital Effects', thanks to a newly developed Digital Signal Processor.
In the FCB-IX470/P models, the internal IR cut filter may be removed by remote control, giving IR sensitivity. A built-in IR lighting by LED may also be added. Combined use produces a minimum sensitivity of '0 lx'.
All models have position preset function to save and recall up to 6 shooting conditions, and extensive control is possible via analog and VISCA™/RS-232C, with optional on screen display.

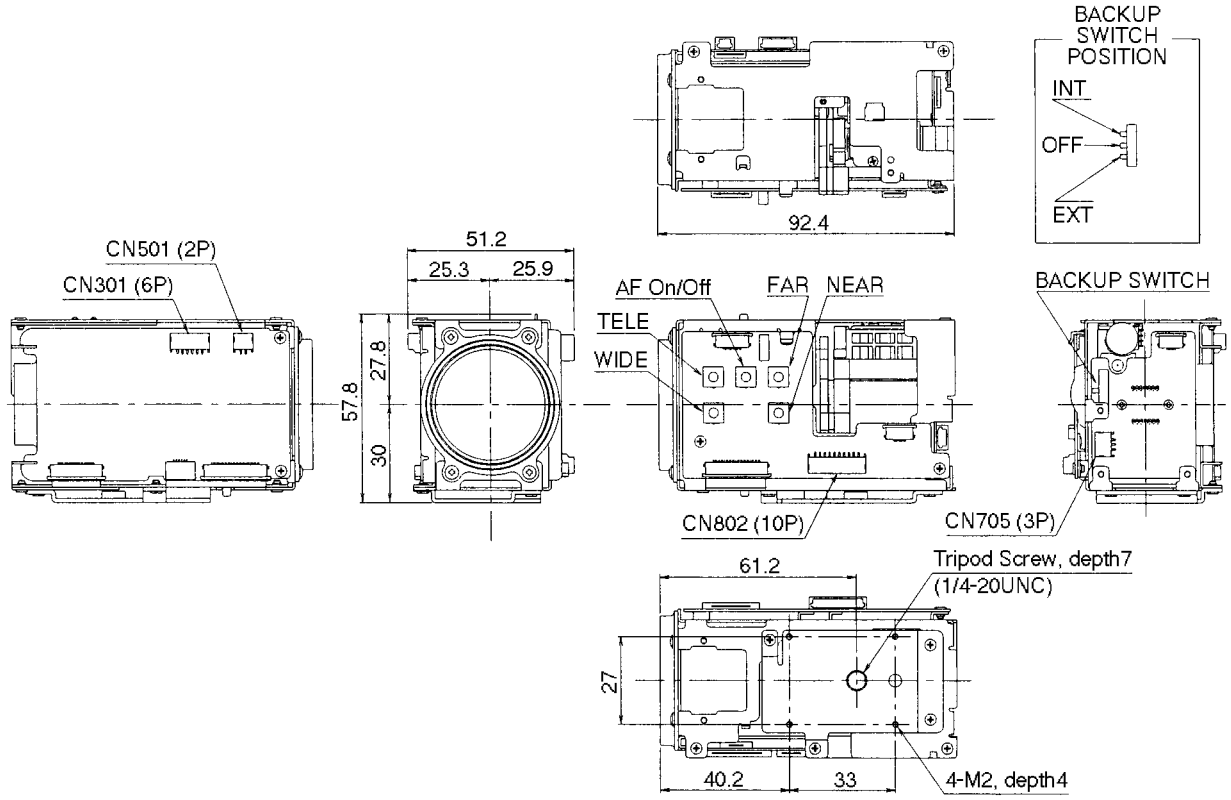
SPECIFICATIONS

	FCB-IX47	FCB-IX470		FCB-IX47P	FCB-IX470P	
Image sensor	1/4" Super HAD CCDTM					
Picture elements	768 (H) × 494 (V)			752 (H) × 582 (V)		
H. resolution	more than 470 TVL			more than 460 TVL		
Lens	18× zoom f = 4.1 to 73.8 mm (F1.4 to F3.0)					
Digital zoom	4× (72× with optical zoom)					
Angle of view (H)	approx. 48° (wide end) approx. 2.7° (tele end)					
Min. working distance	10 mm (wide end) 800 mm (tele end)					
Sync system	Internal					
Min. sensitivity	3 lx (F1.4)	0 lx (F1.4) IR CUT OFF IR LED ON	0.2 lx (F1.4) IR CUT OFF IR LED OFF	3 lx (F1.4)	0 lx (F1.4) IR CUT OFF IR LED ON	0.2 lx (F1.4) IR CUT OFF IR LED OFF
S/N ratio	more than 50 dB					
Back light compensation	ON/OFF					
Electronic shutter	1/4 to 1/10,000 sec., 20 steps			1/3 to 1/10,000 sec., 20 steps		
White balance	Auto, ATW, Indoor, Outdoor, One Push WB, Manual WB					
Gain	Auto/Manual (–3 to 18 dB, 8 steps)					
Aperture	16 steps					
Preset	6 positions					
Battery back-up	approx. 6 months (fully charged)					
Video output	VBS: 1.0 Vp-p (Sync Negative) and Y/C					
Storage temp./humidity	–20 to +60°C/20 to 95%					
Operating temp./humidity	0 to +50°C/20 to 80%					
Power	6 to 12 Vdc/2.8 W (active motors), 4.2 W (active motors and IR LED ON)					
Weight	205 g	220 g		205 g	220 g	
Dimensions (W × H × D) (mm)	51.2 × 57.8 × 92.4	52.3 × 58.8 × 92.4		51.2 × 57.8 × 92.4	52.3 × 58.8 × 92.4	

* "Super HAD CCDTM" is a trademark of Sony Corporation.

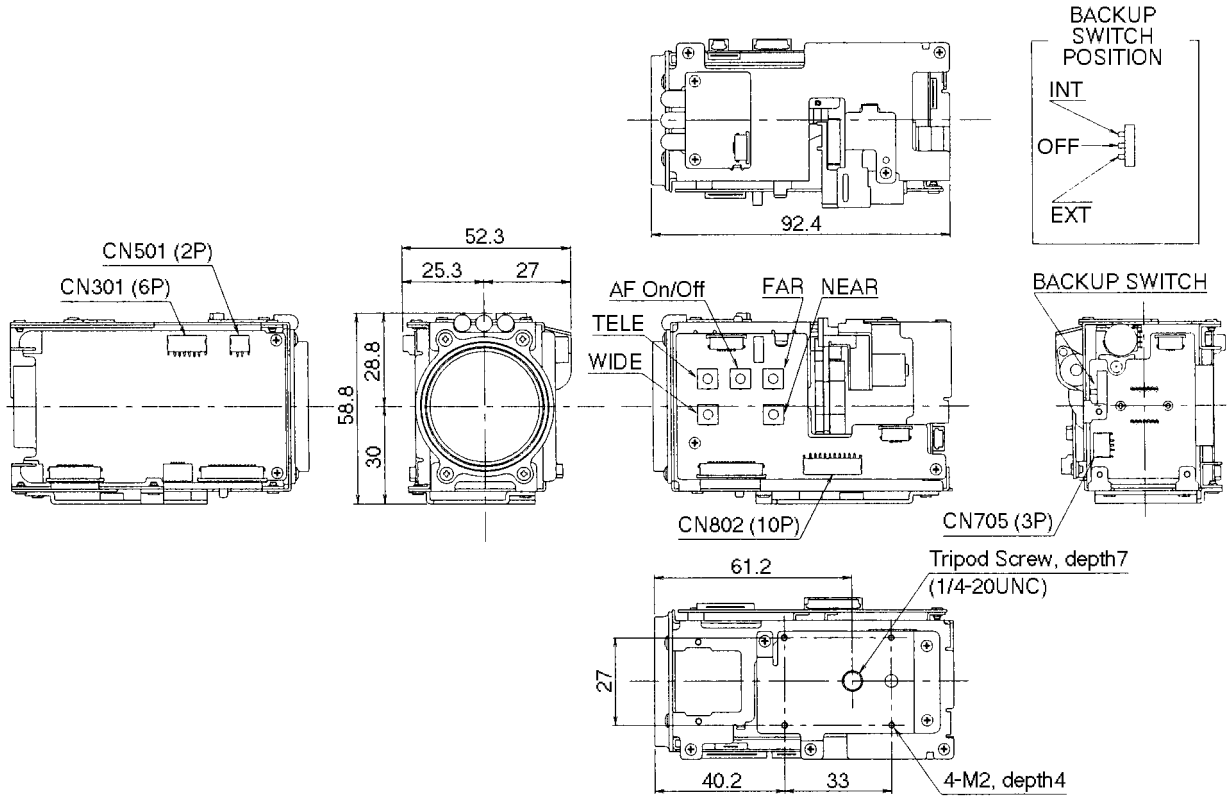
DIMENSIONS

FCB-IX47/IX47P



Unit: mm

FCB-IX470/IX470P

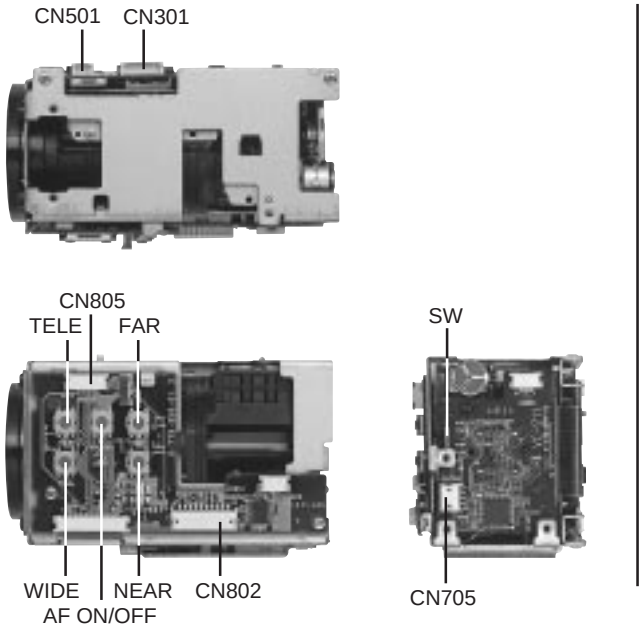


Unit: mm

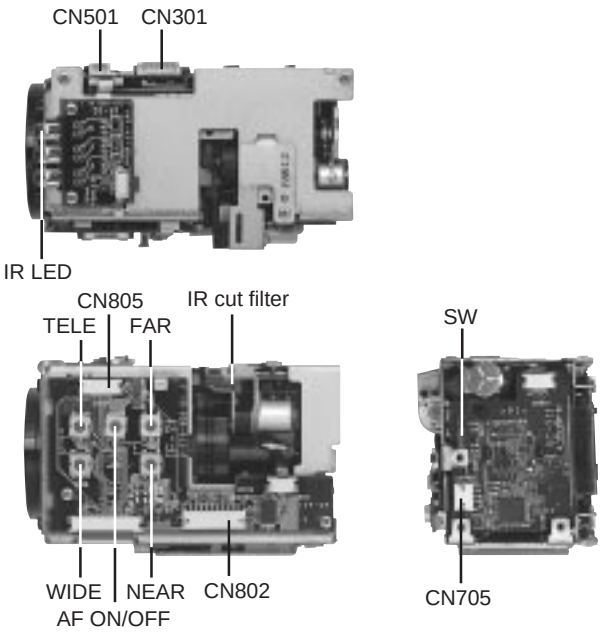
PIN ASSIGNMENT

Connector Position

FCB-IX47/IX47P



FCB-IX470/IX470P



● CN501 (Power)

1	DC IN (6 to 12 V)
2	GND

● CN301 (Video out)

1	GND
2	C OUT
3	GND
4	Y OUT
5	GND
6	VBS OUT

● SW (Memory backup)

INT	Internal battery
OFF	No backup
EXT	External battery (3.1 V)

● CN705 (Backup)

1	BATT IN (3.1 V)
2	GND
3	NC

● CN802 (RS-232C)

1	TXD IN
2	DTR IN
3	DSR IN
4	RXD IN
5	TXD OUT
6	DTR OUT
7	DSR OUT
8	RXD OUT
9	GND
10	NC

● CN805 (External control)

1	GND
2	GND
3	KEY AD0
4	KEY AD1
5	KEY AD2
6	KEY AD3
7	KEY AD4
8	KEY AD5
9	KEY AD6
10	AF ON LED
11	DIGITAL ZOOM POS
12	OPTICAL ZOOM POS

Supplied Accessories

There are five cables packed in the shipping unit carton.

Type of connectors	: JST	
CN501 (Power)	: Camera side S2B-ZR-SM3A-TF	Cable side housing ZHR-2
CN705 (Ext. battery)	: Camera side S3B-ZR-SM3A-TF	Cable side housing ZHR-3
CN301 (Video)	: Camera side S6B-ZR-SM3A-TF	Cable side housing ZHR-6
CN802 (RS-232C)	: Camera side S10B-ZR-SM3A-TF All receptacles are SZH-003T-P0.5	Cable side housing ZHR-10
Type of connector	: Molex	
CN805 (External control)	: Camera side 52689-1240	FFC (0.5 mm pitch)

FUNCTIONS

Basic/Extended Control

Basic control of the camera module functions can be done using the built-in keyboard.
In this mode, user can control zoom (fixed speed), manual focus (fixed speed), and switch AutoFocus ON/OFF.
Shutter speed is fixed 1/60s (1/50s), white balance, iris and gain are automatic.

Extended control of the camera module functions is possible by analog connections (refer to SW-JIG) and by VISCA™/ RS-232C.

Zoom

The FCB-IX47/P and FCB-IX470/P use an 18× zoom lens as well as a 4× digital zoom.

- Optical 18×, f = 4.1 to 73.8 mm (F 1.4 to F 3.0)

The horizontal angle of view is approximately 48° (wide end) to 2.7° (tele end).
The digital zoom is automatically switched ON at the tele end of 18× optical zoom range, with a progressive effect from 1 to 4, giving a total maximum 72× zoom ratio. Digital zoom increases the picture element size and reduces the resolution.

Extended control of zoom:

- Direct zoom position
- Zoom speed selection (8 speeds)
- Digital zoom can switched ON/OFF

FUNCTIONS

Focus

The minimum focus distance is 10 mm at optical wide end and 800 mm at optical tele end, and is independent of digital zoom.

The AutoFocus (AF) function adjusts automatically the focus position to maximise the high frequency content of the picture in a center measurement area, considering the high luminance and strong contrast components.

NOTE **: AVOID 24-hour continuous use of the autofocus. This may cause lens malfunction.**

All of these settings are performed via RS-232C control. If not using the RS-232C, white balance, iris and gain adjustments will be carried out automatically, and the shutter speed will be fixed at 1/60 seconds.

Extended control of focus:

- Direct focus position
- Minimum focus distance limitation
- Manual focus speed selection (8 speeds)
- AutoFocus can be set to High or Low mode
- One Push AF can be achieved in manual focus mode

- HIGH AF : High reaction speed of AF. Use this mode when shooting fast moving objects. Recommended as optimum mode for normal NON-CONTINUOUS use.
- LOW AF : Better focus stability. In low luminance conditions, AF stops operation even when brightness changes, enabling stable images.

White Balance

- Auto : Auto Tracing White Balance with limitations on R and B gain (3200 to 6000 K), to avoid fixing single color scenes as ‘white’
- ATW : Auto Tracing White Balance (2000 to 10000 K)
- Indoor : 3200 K
- Outdoor : 5800 K
- One Push WB : One Push White Balance*
- Manual WB : Manual control of R and B gain, 256 steps each

* The One Push White Balance mode is a fixed white balance mode that may be automatically readjusted only on request of the user (One Push Trigger), assuming that a white subject, in correct lighting conditions, and occupying more than 1/2 of the image, is submitted to the camera.
  Selecting the One Push White Balance mode recalls the white balance data computed at the latest One Push Trigger, if the camera has been left in power ON state, or if the lithium backup battery has been switched ON in charged condition.

FUNCTIONS

Automatic Exposure Mode

This mode is set to “Full Auto” at shipment. Altogether 9 modes are available including this one.

- Full Auto : Auto Iris and Gain, Fixed Shutter (FCB-IX47/470: 1/60 sec., FCB-IX47P/470P: 1/50 sec.)
- Shutter Priority*: Variable Shutter Speed, Auto Iris and Gain
  (1/4 or 1/3 to 1/10,000 sec., 20 steps, std. shutter 16 steps, slow shutter 4 steps)
- Iris Priority : Variable Iris (F1.4 to Close, 18 steps), Auto Gain and Shutter
- Gain Priority : Variable Gain (–3 dB to 18 dB, 18 steps), Auto Iris and Fixed Shutter
- Manual : Variable Shutter, Iris and Gain
- Bright : Variable Iris and Gain (Closed to F1.6, 17 steps at 0 dB: F1.4, 7 steps form 0 to 18 dB)
- Iris Auto : Variable Gain and Shutter
- Shutter Auto : Variable Iris and Gain
- Gain Auto : Variable Iris and Shutter

* Flicker can be eliminated by setting shutter to
→ 1/100s for NTSC models used in countries with 50 Hz power supply frequency
→ 1/120s for PAL models used in countries with 60 Hz power supply frequency

◇ AE – Shutter priority

The shutter can be set freely by the user to a total of 20 steps – 16 high speeds and 4 low speeds. When the slow shutter is set, the speed can be 1/30s (1/25s), 1/15s (1/12s), 1/8s (1/6s), 1/4s (1/3s) for NTSC (PAL) models. The picture output is read at normal rate from the memory. The memory is updated at low rate from the CCD. AF capability is low.
In high speed mode, the shutter can be set up to 1/10000s.
The iris and gain are set automatically, according to the brightness of the subject.

Data	NTSC	PAL	Data	NTSC	PAL
13	10000	10000	09	250	215
12	6000	6000	08	180	150
11	4000	3500	07	125	120
10	3000	2500	06	100	100
0F	2000	1750	05	90	75
0E	1500	1250	04	60	50
0D	1000	1000	03	30	25
0C	725	600	02	15	12
0B	500	425	01	8	6
0A	350	300	00	4	3

FUNCTIONS

◇ AE – Iris priority

The iris can be set freely by the user to 18 steps between F1.4 and Close.

The gain and shutter are set automatically, according to the brightness of the subject.

Data	Setting value	Data	Setting value
11	F1.4	08	F6.8
10	F1.6	07	F8
0F	F2	06	F9.6
0E	F2.4	05	F11
0D	F2.8	04	F14
0C	F3.4	03	F16
0B	F4	02	F19
0A	F4.8	01	F22
09	F5.6	00	CLOSE

◇ AE – Gain priority

The gain can be set freely by the user to 8 steps between –3 dB and +18 dB.

The shutter speed is fixed and the iris is set automatically, according to the brightness of the subject.

Data	Setting value
07	18 dB
06	15 dB
05	12 dB
04	9 dB
03	6 dB
02	3 dB
01	0 dB
00	–3 dB

◇ AE – Manual

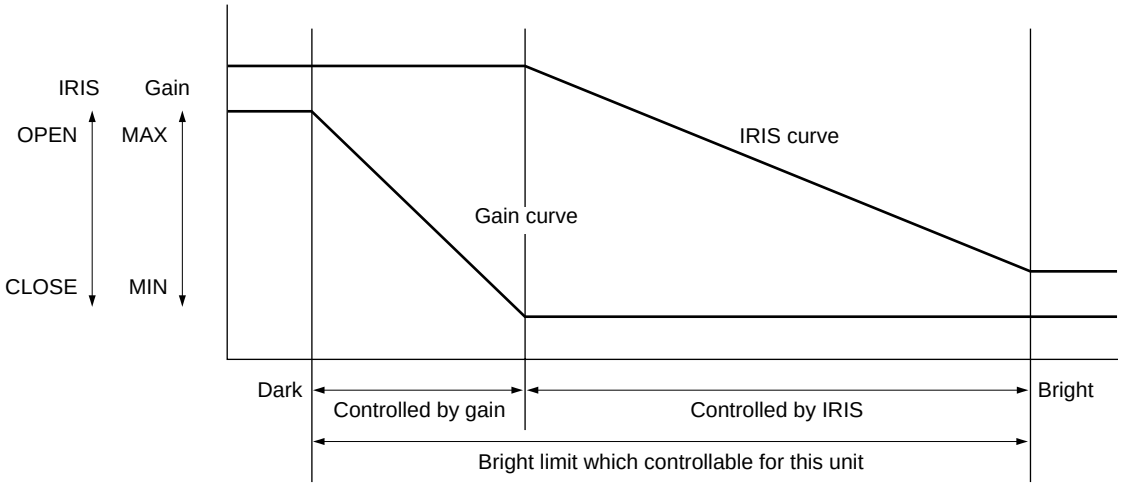
The shutter speed (20 steps), iris (18 steps) and gain (8 steps) can be set freely by the user.

FUNCTIONS

◇ AE – Bright

The bright control function adjusts both gain and iris using an internal law, according to a brightness level freely set by the user. Exposure is controlled by gain when dark and by iris when bright.

As both gain and iris are fixed, they are used when exposing at a fixed camera sensitivity. When switching from the automatic exposure mode or shutter priority automatic exposure mode to the bright mode, the latest state before switching is kept as start value.



Data	Iris	Gain	Data	Iris	Gain
17	F1.4	18 dB	0B	F4	0 dB
16	F1.4	15 dB	0A	F4.8	0 dB
15	F1.4	12 dB	09	F5.6	0 dB
14	F1.4	9 dB	08	F6.8	0 dB
13	F1.4	6 dB	07	F8	0 dB
12	F1.4	3 dB	06	F9.6	0 dB
11	F1.4	0 dB	05	F11	0 dB
10	F1.6	0 dB	04	F14	0 dB
0F	F2	0 dB	03	F16	0 dB
0E	F2.4	0 dB	02	F19	0 dB
0D	F2.8	0 dB	01	F22	0 dB
0C	F3.4	0 dB	00	CLOSE	0 dB

When switching from the shutter priority automatic exposure mode to the bright mode, the bright mode control can be used while maintaining the shutter speed set in the shutter priority automatic exposure mode. When switched to the shutter priority automatic exposure mode, automatic exposure is started at the maintained shutter speed (both iris and gain are automatic).

◇ AE – Shutter Auto

The iris and gain are set freely by the user, and the shutter changes automatically according to the brightness of the subject. Slow shutter is disabled.

◇ AE – Iris Auto

The gain and shutter are set freely by the user, and the iris changes automatically according to the brightness of the subject.

◇ AE – Gain Auto

The iris and shutter are set freely by the user, and the gain changes automatically according to the brightness of the subject.

Exposure Compensation

Exposure compensation is a function which offsets the internal reference brightness level used in the AE mode, by steps of 1.5 dB.

Data	Step	Setting value	Data	Step	Setting value
0E	7	10.5 dB	06	–1	–1.5 dB
0D	6	9 dB	05	–2	–3 dB
0C	5	7.5 dB	04	–3	–4.5 dB
0B	4	6 dB	03	–4	–6 dB
0A	3	4.5 dB	02	–5	–7.5 dB
09	2	3 dB	01	–6	–9 dB
08	1	1.5 dB	00	–7	–10.5 dB
07	0	0 dB			

Aperture Control

Aperture control is a function which adjusts the enhancement of the edges of objects in the picture. There are 16 steps of adjustment, starting from “no enhancement”. When shooting small characters, this control may help making them sharper.

Back Light Compensation

When the background of the subject is too bright, or when the subject is too dark due to shooting in the AE mode, back light compensation will make the subject appear clearer.

FUNCTIONS

Title Display

The camera can be given a title containing up to 20 characters such as “ENTRANCE” or “LOBBY”. The position of the first character (horizontal, vertical) of the title, blinking state, and color can also be changed.

Vposition	00 to 0A	
Hposition	00 to 17	
Blink	00: Does not blink	
	01: Blinks	
Color	00	White
	01	Yellow
	02	Violet
	03	Red
	04	Cyan
	05	Green
	06	Blue

Table of character codes

00	01	02	03	04	05	06	07
A	B	C	D	E	F	G	H
08	09	0a	0b	0c	0d	0e	0f
I	J	K	L	M	N	O	P
10	11	12	13	14	15	16	17
Q	R	S	T	U	V	W	X
18	19	1a	1b	1c	1d	1e	1f
Y	Z	&		?	!	1	2
20	21	22	23	24	25	26	27
3	4	5	6	7	8	9	0
28	29	2a	2b	2c	2d	2e	2f
À	È	Ì	Ò	Ù	Á	É	Í
30	31	32	33	34	35	36	37
Ó	Ú	Â	Ê	Ô	AE	OE	Ã
38	39	3a	3b	3c	3d	3e	3f
Õ	Ñ	Ç	β	Ä	Ï	Ö	Ü
40	41	42	43	44	45	46	47
Å	$	₣	¥	DM	£	¿	¡
48	49	4a	4b	4c	4d	4e	4f
ϕ	”	:	’	.	,	/	–

Camera ID

The ID can be set up to 65,536 (0000 to FFFF). As this will be memorized in the nonvolatile memory inside, data will be saved regardless of whether it has been backed up.

Picture Effect

It consists of the following functions.

- Pastel : Pastel Image
- Neg. Art : Negative/Positive Reversal
- Sepia : Sepia Image
- Black White : Monochrome Image
- Solarize : Enhanced Contrast
- Mosaic : Mosaic Image
- Slim : Vertical Stretch
- Stretch : Horizontal Stretch

FUNCTIONS

Digital Effect

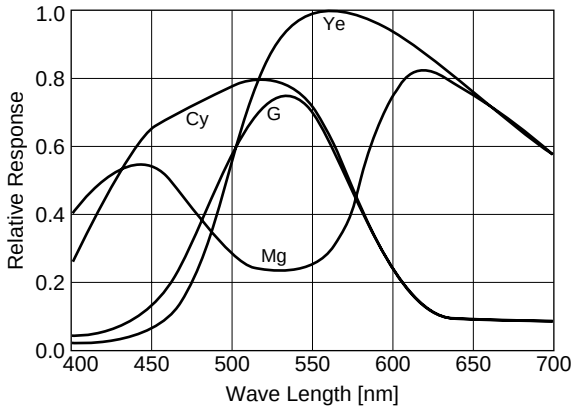
It consists of the following functions. They are all executed via the field memory.

- Still : Motion Image on Still Image
- Flash: Continuous Still Image
- Lumi: Motion Images on Binaried Still Image
- Trail : Afterimage Lag of Motion Subject

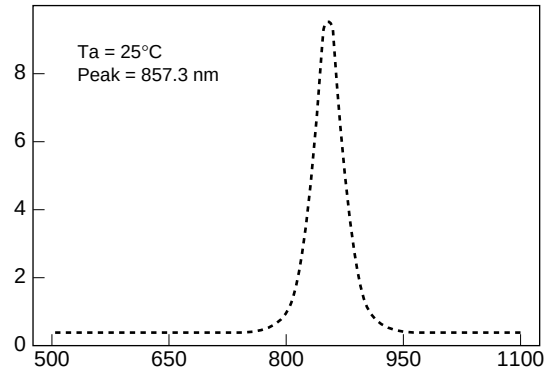
Others

◇ 0 LuxShot

The FCB-IX470/P is equipped with a motorized mechanism to remove the internal IR cut filter on demand, making the camera sensitive to close IR. An additional IR lighting may be added by switching the IR LEDs ON. In this latest mode, the FCB-IX470/P can shoot without external light, achieving a minimum sensitivity of 0 lx.



CCD Visible Spectral Response



IR LED Spectral Response

The supplied IR LED has a limited energy range allowing a working distance of approximately 2 to 3 meters.

NOTE **: In the "0 lx" shot mode, the iris is fixed at F1.4 and high speed shutter control cannot be performed. Only the gain and low speed shutter can be controlled. However, iris and shutter values displayed may differ from the actual values. Do not suspect a fault.**
In the "0 lx" shot mode, the picture looks slightly greenish, like an image intensifier picture. This may be suppressed by selection of the "Black & White" mode in the "Picture Effect" menu.

◇ Mirror image

The video output from the camera can be reversed left and right using this function.

◇ Freeze

This function captures an image in the field memory of the camera so that this image can be output continuously.

FUNCTIONS

◇ Memory (Position preset)

Using the position preset function, 6 sets of camera shooting conditions can be stored and recalled.
This function allows the desired zoom position, focus (auto, manual positions), white balance, shutter, bright control, iris, gain, exposure compensation, back light compensation, and aperture to be set instantaneously without having to adjust them each time. It also memorizes the settings for electronic zoom on/off, slow shutter auto/manual, 0 lx shot on/off, IR LED on/off.

◇ Date, Time display

When used together with the display command, displays the date and time will be displayed on the video monitor.
Time difference is ±30 seconds monthly.

◇ Backup

Backs up the contents memorized by the memory (position preset) function and the camera functions when the power is turned OFF.
The backup switch can be switched as follows.

- INT side : Backs up for about 6 months when the internal battery is fully recharged.
  (Full recharge by letting about 24 hours in power ON state.)
- OFF side : No back up. Set to this position at shipment.
  (This setting is set when the power is turned ON the next time.)
- EXT side : Backs up by the external power supply input to the CN705 connector.
  Power supply voltage : 3.1 V ± 0.2 V
  Current consumption : 6 µA

◇ Zoom position analog output

Zoom position analog signals can be output by the CN805 connector of the IF-71 board.

Optical zoom position	×1	×18
Analog output	0 V	3.1 V
Output tolerance	±10%	
Output pin	CN805, 12P	

Digital zoom position	×1	×4
Analog output	0 V	3.1 V
Output tolerance	±10%	
Output pin	CN805, 11P	

◇ Slow shutter – Auto/Manual

When set to “Auto”, controls so that the slow shutter is set automatically when the brightness drops. Effective only when the AE mode is set to “Full Auto”.
Set to “Slow Shutter Manual” at shipment.

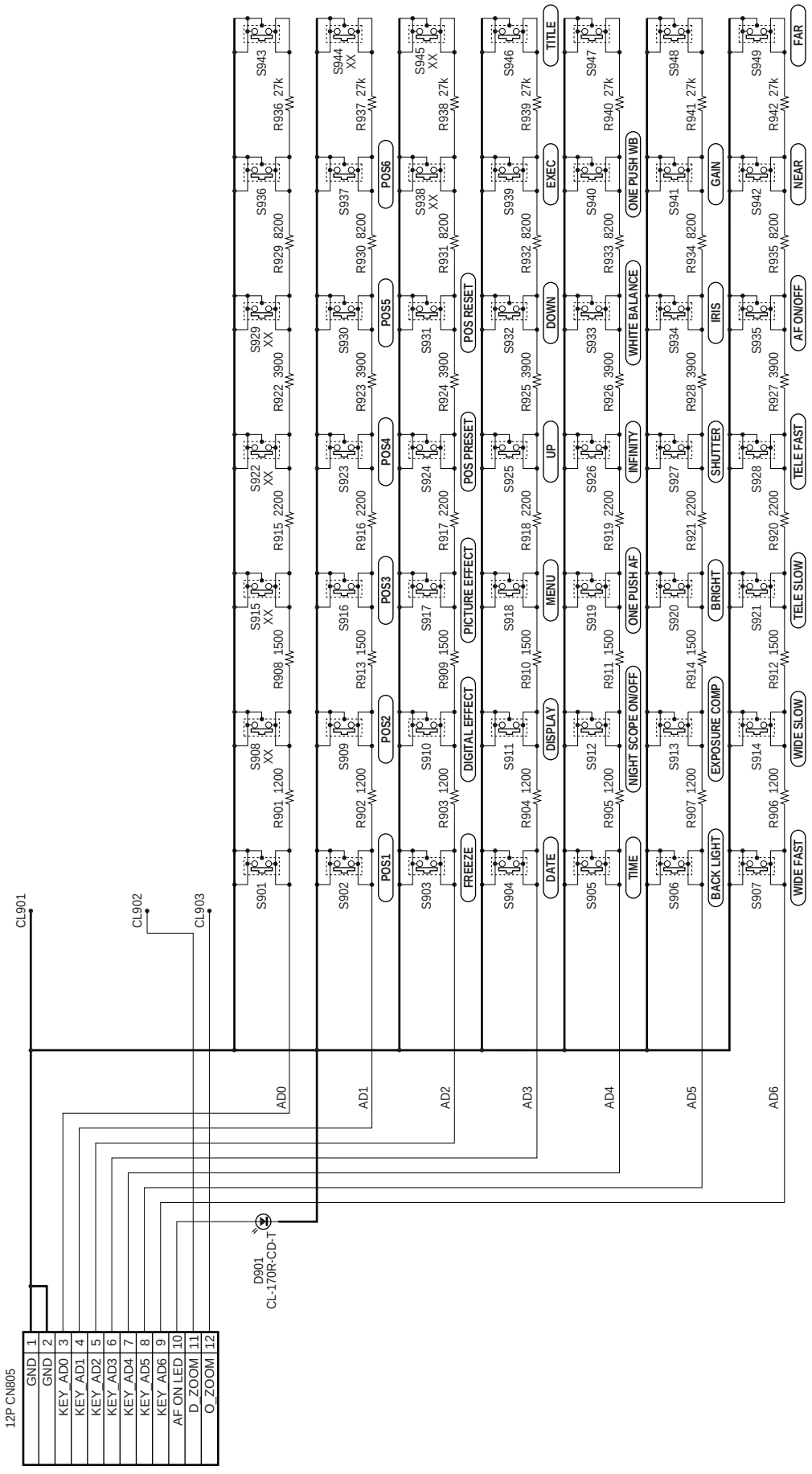
CONTROL METHODS

If the camera is not to be controlled via RS-232C, pressing the switch of the IF-71 board on the camera side controls the zoom and focus. When the red LED is lit, it is in an auto focus mode.
Supply 6 to 12 Vdc to CN501. The composite and Y/C signals will be output from CN301. The SW (memory backup) is set to "OFF" at the shipment. When set to "INT", the zoom and focus states can be backed up. The battery backs up the data for six months when fully recharged.

Most of the camera functions can be controlled by the SW-JIG (reference circuit). Connect the SW-JIG by the 12-pin flat cable provided.

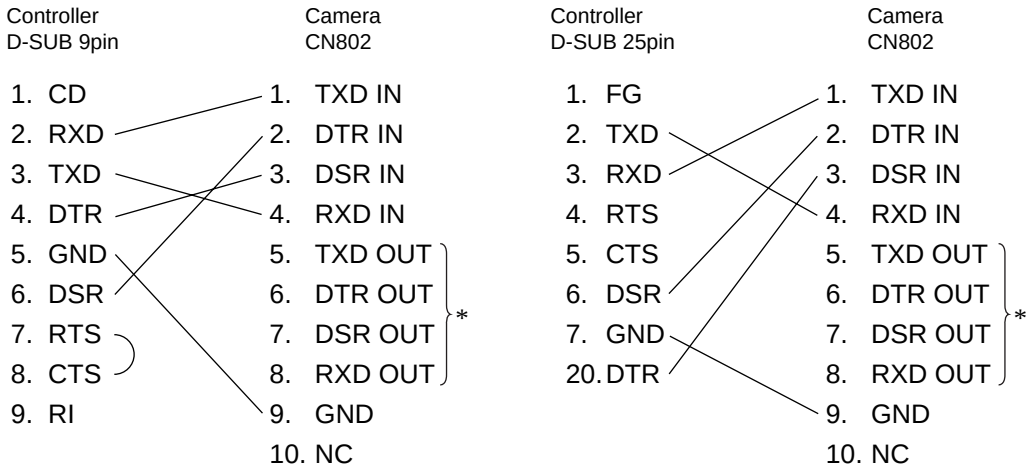
CONTROL METHODS

SW-JIG Reference Circuit

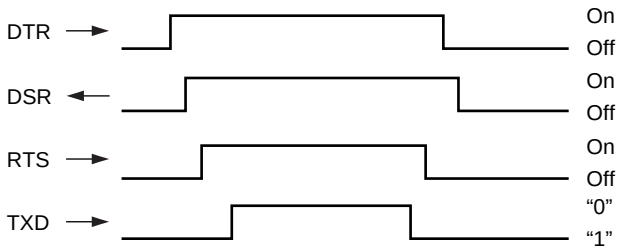


CONTROL METHODS

Controlled by VISCA™/RS-232C



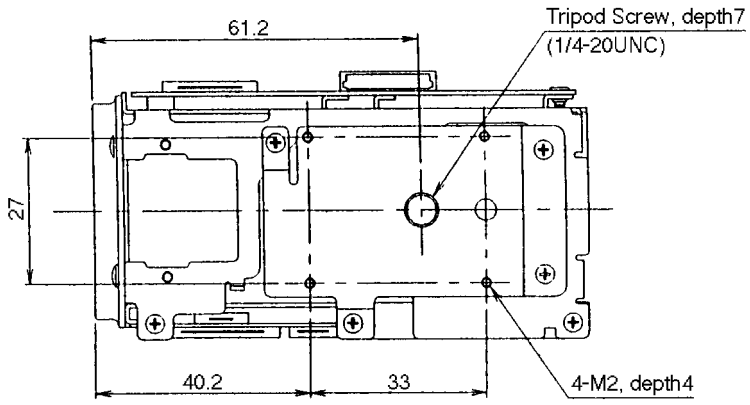
* These pins are for the second camera. They need not be connected if controlling only one unit.



* “VISCA™” is a trademark of Sony Corporation.

INSTALLATION

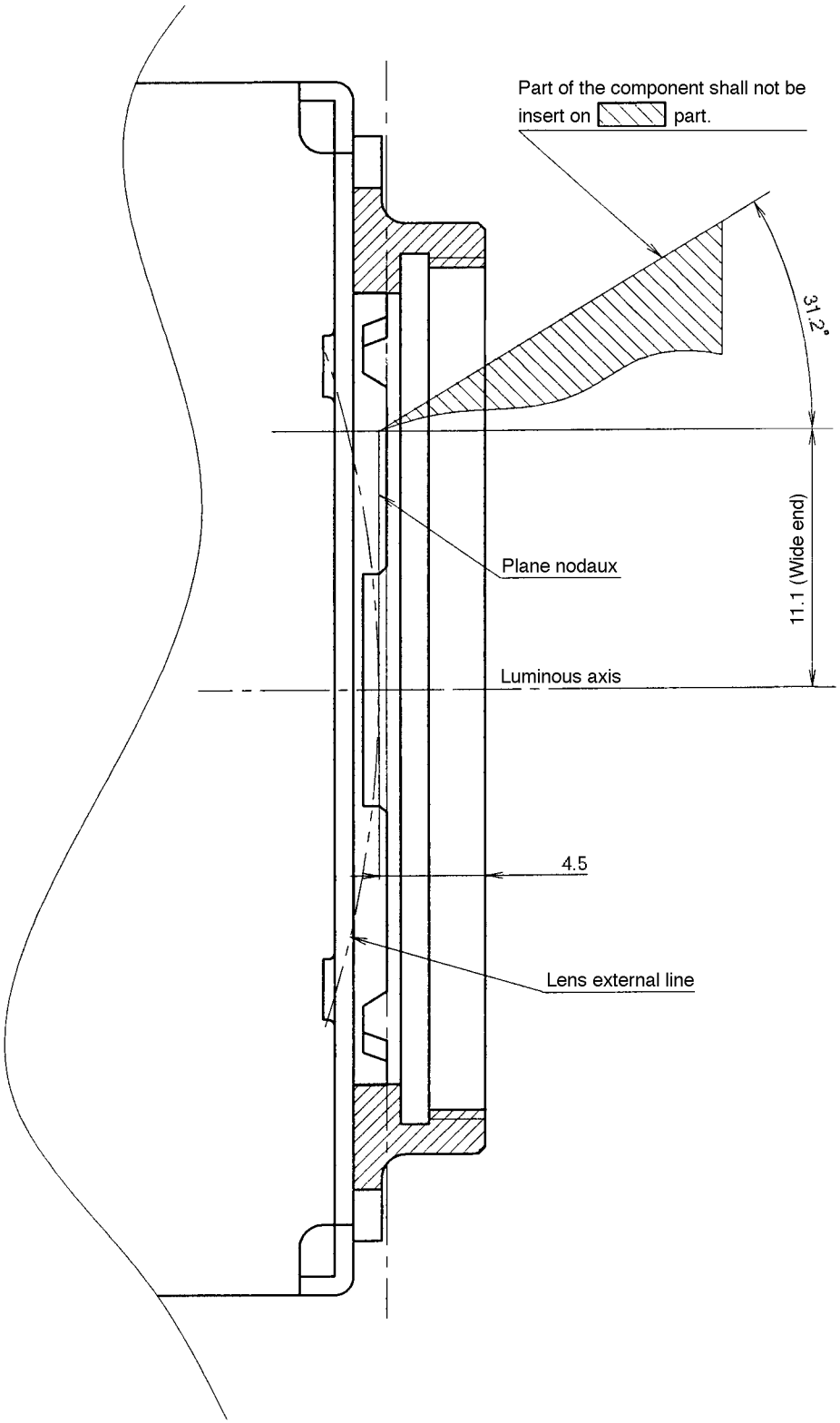
To fix the camera, 1/4-20UNC or 4 of M2 is used.



Unit: mm

ECLIPSE

When designing the housing, refer to the dimensional allowance as shown in the figure below.



HANDLING PRECAUTIONS

◇ Operation

Start the camera control software in your PC after you turn on the camera and the image is displayed.

◇ Handling

Be careful not to spill water or other liquids on the unit, or allow combustible or metallic objects to fall inside the body. If used with foreign matter inside, the camera is liable to fail, or be a cause of fire or electric shock.

◇ Operation and storage locations

Do not shoot images that are extremely bright (e.g., light source, sun, etc.) for long periods of time. Do not use or store the camera in the following extreme conditions:

- Extremely hot or cold places (operating temperature 0°C to +50°C [32°F to 122°F])
- Damp or dusty places
- Where it is exposed to rain
- Where it is subject to strong vibration
- Close to generators of powerful electromagnetic radiation such as radio or TV transmitters.
- Where it is subject to fluorescent light reflections
- Where it is subject to unstable (flickering, etc.) lighting conditions.

◇ Care of the unit

Remove dust or dirt on the surface of the lens with a blower (commercially available).

◇ Other

- Do not apply excessive force to the printed circuit board.
- Do not apply excessive voltage. (Use only the specified voltage.)
- Wear a wrist band when touching the printed circuit board. This will prevent static electricity that could damage the board. Use the supplied antistatic bag to package the board.
- When you transport the camera, repack it as it was originally shipped.

In case of abnormal operation, contact your authorized Sony dealer or the store where you purchased the product.

◇ Automatic focus

Avoid 24-hour continuous use of the auto-focus mode. This can cause lens malfunction.

◇ Software

The “RS-232C Command List” and demonstration software for Windows® 95 and Windows® NT4.0 are available upon request. The software is available for evaluation and/or demonstration only. Use of the software with customer developed application software may damage hardware, application program and the camera. Sony Corporation is not liable for any damages under these conditions.

* Microsoft®, Windows® are trademarks of Microsoft Corporation.

VIBRATIONAL SPECIFICATIONS

◇ Test method (Random vibration)

- Fix the camera at the four fixation points of the base using M2 screws.
- Perform the random vibration test under the following conditions in the X, Y and Z directions for 20 minutes in each direction.
- The camera vibrational specification is to have no malfunction after this test.

Power spectrum density	5 to 50 Hz 4.14 m^2/s^3 {0.043 G^2/Hz} 50 to 100 Hz –36 dB/oct
Effective overall value	14.3 m/s^2 {1.46 G}
Test time	20 minutes

INITIAL VALUE AND BACKUP

◇ Control mode initial value and back up

Mode/Position	Initial value	Back up in power failure	Back up at standby*
VISCA™ Address	1	×	○
Power	On	—	—
Zoom Position	Wide end	○	○
D-Zoom	On	○	○
Focus Position	—	○	○
Focus Mode	Auto	○	○
AF Sensibility	High	○	○
Near Limit	C000h	○	○
WB Mode	Auto	○	○
WB Data	—	○	○
OnePush WB Data	—	○	○
Manual WB Data	—	○	○
AE Mode	Full Auto	○	○
Slow Shutter Mode	Manual	○	○
Shutter	1/60 sec. (NTSC), 1/50 sec. (PAL)	○	○
Iris	—	○	○
Gain	—	○	○
Bright	—	○	○
Exposure compensation	Off	○	○
Exposure compensation amount	±0	○	○
BackLight (Back light compensation)	Off	○	○
Aperture	5	○	○
Zero Lux Shot	Off	○	○
IR Light	On	○	○
Wide Mode	Off	○	○
LR Reverse	Off	○	○
Freeze	Off	×	×
Picture Effect	Off	×	×
Digital Effect	Off	×	×
Digital Effect Level	0	○	○
Camera Memory	Same as the initial value setting	○	○
Display (Data Screen)	Off	○	○
Clock	1998/1/1	○	○
Date Display	Off	○	○
Time Display	Off	○	○
Title Display	Off	○	○
Key Lock	Off	×	○
Camera ID	0000h	○	○

* When CamPowerOff

MODE CONDITIONS

◇ Mode transition conditions

Mode	Power Off	Initial-izing	Power On	Freeze On
Address Set	○	○	○	○
IF_Clear	○	○	○	○
Command Cancel	○	○	○	○
Power On	○	○	○	○
Power Off	○	×	○	○

Mode	Power Off	Initial-izing	Power On	Freeze On	Focus Auto	Zoom Direct	Focus Direct	ZmFo Direct	Mem Recall
Zoom Tele/Wide/Stop	×	×	○	×	○	×	○	×	×
Zoom Direct	×	×	○	×	○	○	○	×	×
D-Zoom On/Off	×	×	○	○	○	○	○	○	○
Zoom Focus Direct	×	×	○	×	○	×	×	○	×
Focus Far /Near/Stop	×	×	○	×	×	○	×	×	×
Focus Direct	×	×	○	×	×	○	○	×	×
Focus Auto/Manual	×	×	○	×	○	○	○	○	○
One Push AF	×	×	○	×	×	○	×	×	×
Focus Infinity	×	×	○	×	○	○	×	×	×
AF Sensibility High/Low	×	×	○	○	○	○	○	○	○
Focus Near Limit	×	×	○	○	○	○	○	○	○
Camera Memory Set/Reset	×	×	○	○	○	○	○	○	○
Camera Memory Recall	×	×	○	○	○	×	×	×	○ *

* × during recalling from key

Mode	Power Off	Initial-izing	Power On	Freeze On	WB Auto	Indoor	Outdoor	One Push	ATW	Manual
WB Mode switching	×	×	○	×	○	○	○	○	○	○
One Push WB	×	×	○	×	×	×	×	○	×	×
RGain setting	×	×	○	×	×	×	×	×	×	○
BGain setting	×	×	○	×	×	×	×	×	×	○

MODE CONDITIONS

Mode	Power Off	Initial-izing	Freeze On	AE Full Auto	AE Manual	Shutter Pri	Iris Priority	Gain Priority	Shutter Auto	Iris Auto	Gain Auto	Bright
AE Full Auto	×	×	×	○	○	○	○	○	○	○	○	○
AE Manual	×	×	×	○	○	○	○	○	○	○	○	○
Shutter Priority	×	×	×	○	○	○	○	○	○	○	○	○
Iris Priority	×	×	×	○	○	○	○	○	○	○	○	○
Gain Priority	×	×	×	○	○	○	○	○	○	○	○	○
Shutter Auto	×	×	×	○	○	○	○	○	○	○	○	○
Iris Auto	×	×	×	○	○	○	○	○	○	○	○	○
Gain Auto	×	×	×	○	○	○	○	○	○	○	○	○
Bright	×	×	×	○	×	○	×	×	×	×	×	×
Shutter setting*2	×	×	×	×	○	○	×	×	×	○	○	×*1
Iris setting	×	×	×	×	○	×	○	×	○	×	○	×
Gain setting	×	×	×	×	○	×	×	○	○	○	×	×
Bright setting	×	×	×	×	×	×	×	×	×	×	×	○
Slow Shutter Auto/Manual	×	×	×	○	○	○	○	○	○	○	○	○
Exposure compensation On/Off	×	×	×	○	○	○	○	○	○	○	○	○
Exposure compensation setting*3	×	×	×	○	○	○	○	○	○	○	○	○
BackLight On/Off	×	×	×	○	×	×	×	×	×	×	×	×

*1 : ○ only when entering Bright mode from Shutter Priority
*2 : Cannot set Slow Shutter for Digital Effect
*3 : × when exposure compensation is Off

Mode	Power Off	Initial-izing	Power On	Freeze On
Aperture setting	×	×	○	×
ZeroLuxShot On/Off	×	×	○	×
IR_Light On/Off	×	×	○	○
Wide Mode	×	×	○	×
LR_Reverse On/Off	×	×	○	×
Freeze On/Off	×	×	○*1	○
Picture Effect setting	×	×	○	×
Digital Effect setting	×	×	○*2	×
Display On/Off	×	×	○	○
Date/Time setting	×	×	○	○
Date/Display On/Off	×	×	○	○
Time Display On/Off	×	×	○	○
Title setting	×	×	○	○
Key Lock On/Off	×	×	○	○
ID Write	×	×	○	○

*1 : × when Slow Shutter and Digital Effect
*2 : × when Slow Shutter

Command List

(Ver. 1.0) —English—

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COMMAND LIST 34

Sony reserves the right to change specifications of the products and discontinue products without notice.

Use of the RS-232C control software which is developed based upon this command list may cause malfunction or damage to hardware and software. Sony Corporation is not liable for any of such damages.

VISCA™/RS-232C

The VISCA™ is a protocol which controls consumer camcorders developed by Sony. The command which can be used will differ for each product. Refer to the command list of each product.

Outline of VISCA™

In the VISCA™, the side outputting commands such as the computer is called the controller, while the receiving of the commands such as the FCB camera is called the peripheral device. The FCB camera serves as a peripheral device of VISCA™. In VISCA™, up to seven peripheral devices such as the FCB camera can be connected to one controller using communication conforming to RS-232C. The parameters of RS-232C are as follows.

- Communication speed : 9600 bps
- Data bits : 8
- Start bit : 1
- Stop bit : 1
- Non parity
- MSB first

  Flow control using XON/XOFF and RTS/CTS, etc. is not supported.

The peripheral devices are connected in a daisy chain. As shown in **Fig. 1**, the actual internal connection is a one-direction ring, so that messages return to the controller via the peripheral devices. The devices on the network are assigned addresses. The address of the controller is fixed at 0. The addresses of the peripheral devices are 1, 2, 3 in the order from the one nearest to the controller. The address of the peripheral device is set by sending address commands during the initialization of the network.

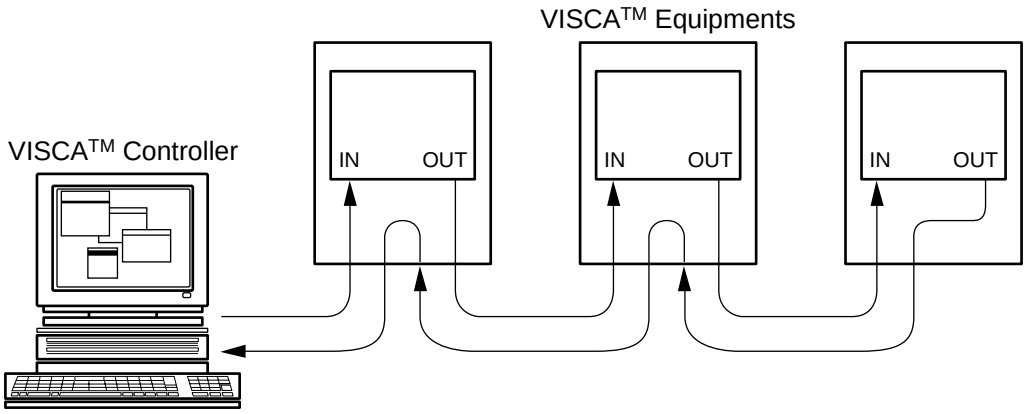


Fig. 1 VISCA™ network configuration

The VISCA™ devices each have a VISCA™ IN and VISCA™ OUT terminal.
Set the DTR input (S output of the controller) of VISCA™ IN to H when controlling from the controller.

* “VISCA™” is a trademark of Sony Corporation.

VISCA™ Connection

The camera has an interface made up of connectors for 10-pin internal wirings. For an example of connection, refer to the command list for each model.
The following shows one example.

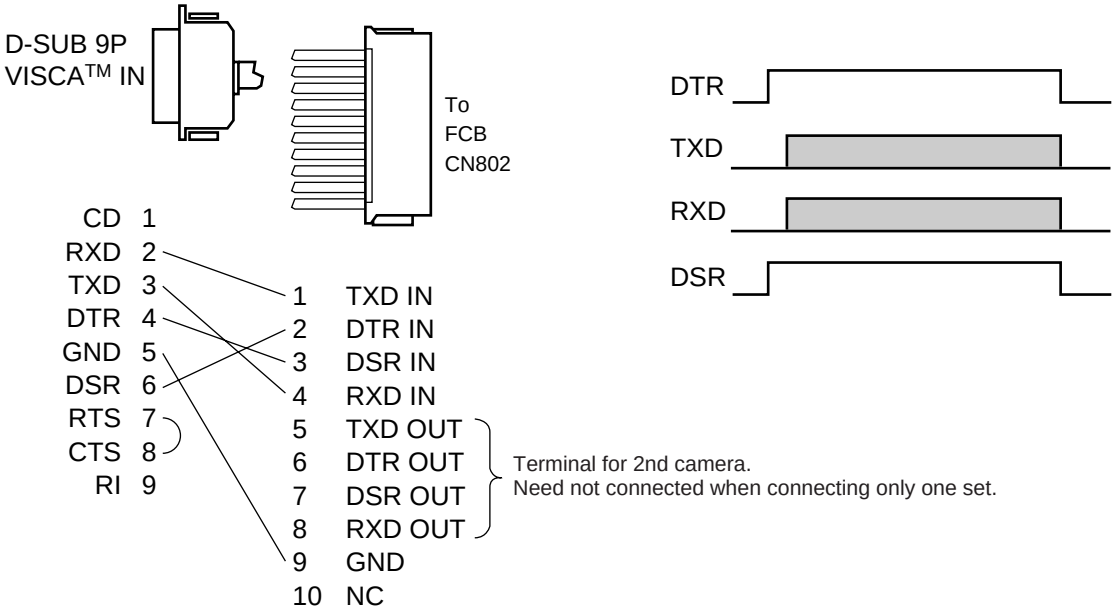


Fig. 2 Connection of D-SUB 9-pin and FCB camera

RS-232C Connection

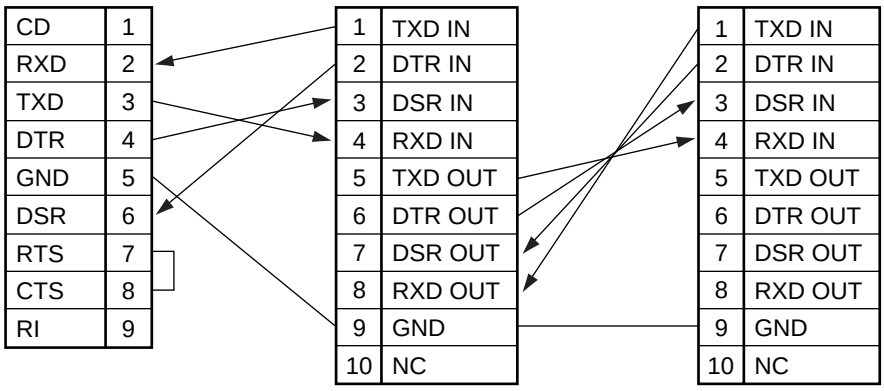
● FCB CN802

RS-232C interface pin assignment

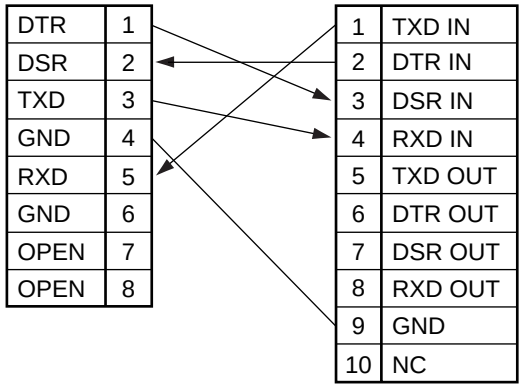
1	TXD IN	Transmit Data	Connect to Controller
2	DTR IN	Data Transmission Ready	
3	DSR IN	Data Set Ready	
4	RXD IN	Receive Data	
5	TXD OUT	Transmit Data	Connect to next Camera
6	DTR OUT	Data Transmission Ready	
7	DSR OUT	Data Set Ready	
8	RXD OUT	Receive Data	
9	GND	Ground	
10	NC		

● Controller (PC)

Windows D-sub 9P — FCB CN802 — Next FCB CN802



● Macintosh — FCB CN802



VISCA™ Communication Specifications

◇ VISCA™ packet structure

The basic unit of VISCA™ communication is called packet (**Fig. 3**). The first byte of the packet is called header and comprises the sender's and receiver's addresses. For example, the header of the packet sent to the FCB camera of address 1 from the controller of address 0 is hexadecimal 81H. The packet sent to the FCB camera of address 2 is 82H. In the command list, as the header is 8X, input the address of the FCB camera at X. The header of the reply packet from the FCB camera of address 1 is 90H. The packet from the FCB camera of address 2 is A0H.

Some of the commands for setting the FCB camera can be sent to all devices at one time (broadcast). In the case of broadcast, the header should be hexadecimal and 88H.

When the terminator is FFH, it signifies the end of the packet.

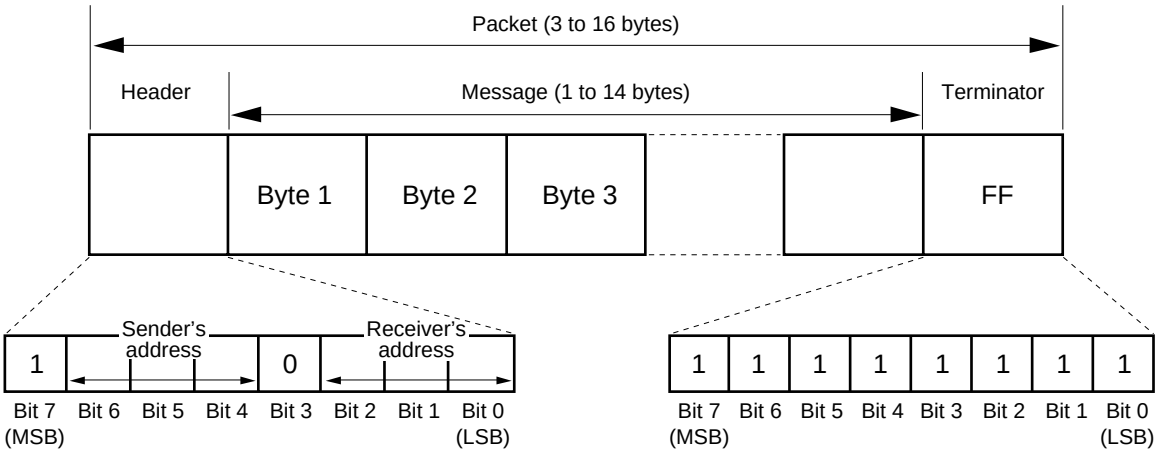


Fig. 3 Packet structure

◇ Command and inquiry

- Command: Commands operations to the FCB camera.
- Inquiry : Used for examining the state of the FCB camera.

	Command Packet	**Note**
Inquiry	8X QQ RR ... FF	QQ = Command/Inquiry, RR = category code*

*QQ = 01 (Command), 09 (Inquiry)

*RR = 00 (Interface), 04 (camera 1), 06 (Pan/Tilter), 07 (Camera 2)

*X = 1 to 7: FCB camera address

VISCA™/RS-232C

◇ Response for command and inquiry

● ACK message : Returned by the FCB camera when it receives the command. No ACK message is returned for inquiries.

● Completion message : Returned by the FCB camera when execution of commands and inquiries is completed. In the case of inquiry commands, it will contain reply data for the inquiry after the 3rd byte of the packet. If the ACK message is omitted, the socket number will contain a 0.

	Reply Packet	**Note**
Ack	X0 4Y FF	Y = socket number
Completion (commands)	X0 5Y FF	Y = socket number
Completion (Inquiries)	X0 5Y ... FF	Y = socket number

X = 9 to F: FCB camera address + 8

● Error message : When a command or inquiry command could not be executed or failed to be executed, the error message is returned as instead of the completion message.

Error Packet	**Description**
X0 6Y 01 FF	Message length error (>14 bytes)
X0 6Y 02 FF	Syntax Error
X0 6Y 03 FF	Command buffer full
X0 6Y 04 FF	Command cancelled
X0 6Y 05 FF	No socket (to be cancelled)
X0 6Y 41 FF	Command not excutable

X = 9 to F: FCB camera address + 8, Y = socket number

◇ Socket number

When command messages are sent to the FCB camera, it is normal to send the next command message after waiting for the completion message or error message to return. However to deal with advanced uses, the FCB camera has two buffers (memories) for commands, so that up to two commands including the commands being executed can be received. When the FCB camera receives commands, it notifies which command buffer was used using the socket number of the ACK message. As the completion message or error message also has a socket number, it indicates which command has ended. Even when two command buffers are used, the command for FCB camera management and some inquiry messages can be executed.
The ACK message is not returned for these commands and inquiries, and only the completion message of socket number 0 is returned.

VISCA™/RS-232C

◇ Command execution cancel

The IF_Clear command is sent to cancel a command after sending it. Use the cancel message to cancel one of the two commands sent.

	Cancel Packet	Note
Cancel	8X 2Y FF	Y = socket number

X = 1 to 7: FCB camera address, Y = socket number

The Command canceled error message will be returned for this command, but this is not a fault. It indicates that the command has been canceled.

VISCA™ Device Setting Command

Before starting control of the FCB camera, be sure to send the Address command and IF_Clear command using the broadcast.

◇ For VISCA™ network administration

- Address : Sets the address of the peripheral device. Use when initializing the network, and receiving the following network change message.

- Network Change : Sent from the peripheral device to the controller when the device is removed or added from or to the network. The address must be re-set when this message is received.

	Packet	Note
Address	88 30 01 FF	Always broadcasted.
Network Change	X0 38 FF	

X = 9 to F: FCB camera address + 8

◇ VISCA™ interface command

- IF_Clear: Clears the command buffers in the FCB camera and cancels the command being executed.

	Command Packet	Reply Packet	Note
IF_Clear	8X 01 00 01 FF	X0 50 FF	
IF_Clear (broadcast)	88 01 00 01 FF	88 01 00 01 FF	

X = 1 to 7: FCB camera board address (For inquiry packet)
X = 9 to F: FCB camera board address +8 (For reply packet)

◇ VISCA™ interface and inquiry

- IF_DeviceTypeInq: Returns information on the VISCA™ interface.

Inquiry	Inquiry Packet	Reply Packet	Description
IF_DeviceTypeinq	8X 09 00 02 FF	Y0 50 GG GG HH HH JJ JJ KK FF	GGGG = Vender ID (0020: Sony) HHHH = Model ID 0401: FCB-IX series JJJJ = ROM revision KK = Maximum socket # (02)

X = 1 to 7: FCB camera address (For inquiry packet)
X = 9 to F: FCB camera address +8 (For reply packet)

VISCA™ Command/ACK Protocol

Command	Command Message	Reply Message	Comments
General Command	81 01 04 38 02 FF (Example)	90 41 FF (ACK) + 90 51 FF (Completion) 90 42 FF 90 52 FF	Returns ACK when a command has been accepted, and Completion when a command has been executed.
	81 01 04 38 FF (Example)	90 60 02 FF (Syntax Error)	Accepted a command lacking parameters.
	81 01 04 38 02 FF (Example)	90 60 03 FF (Command Buffer Full)	There are two commands being executed, and the command could not be accepted.
	81 01 04 08 02 FF (Example)	90 61 41 FF (Command Not Executable) 90 62 41FF	Could not execute the command in the current mode.
Inquiry Command	81 09 04 38 FF (Example)	90 50 02 FF (Completion)	ACK is not returned for the inquiry command.
	81 09 05 38 FF (Example)	90 60 02 FF (Syntax Error)	Accepted non-corresponding command.
Address Set	88 30 01 FF	88 30 02 FF	Returned the device address to +1.
IF_Clear (Broadcast)	88 01 00 01 FF	88 01 00 01 FF	Returned the same command.
IF_Clear (For x)	8x 01 00 01 FF	z0 50 FF (Completion)	ACK is not returned for this command.
Command Cancel	8x 2y FF	z0 6y 04 FF (Command Canceled)	Returned when the command of the socket specified is canceled. Completion of the command canceled is not returned.
		z0 6y 05 FF (No Socket)	Returned when the command of the specified socket has already been completed or when the socket number specified is wrong.

VISCA™ Camera Issue Message

◇ ACK/Completion Message

	Command Message	Comments
ACK	z0 4y FF (y: Socket No.)	Returned when the command is accepted.
Completion	z0 5y FF (y: Socket No.)	Returned when the command has been executed.

z = Device address + 8

◇ Error Message

	Command Message	Comments
Syntax Error	z0 60 02 FF	Returned when the command format is different or when a command with illegal command parameters is accepted.
Command Buffer Full	z0 60 03 FF	Indicates that two sockets are already being used (executing two commands) and the command could not be accepted when received.
Command Canceled	z0 6y 04 FF (y: Socket No.)	Returned when the command executed by the specified socket is canceled by the cancel command. The completion message being executed is not returned.
No Socket	z0 6y 05 FF (y: Socket No.)	Returned when no command is executed by the specified socket due to the cancel command, or when an invalid socket number is specified.
Command Not Executable	z0 6y 41 FF (y: Socket No.)	Returned when an unoperatable command is received due to conditions. For example, when commands controlling the focus manually are received during auto focus.

◇ Network Change Message

	Command Message	Comments
Network Change	z0 38 FF	Issued when power to the camera is conducted, when the VISCA™ device is connected to or disconnected from the VISCA™ OUT terminal.

COMMAND LIST

FCB-IX Series Command List (1/4)

Command Set	Command	Command Packet	Comments
AddressSet	Broadcast	88 30 01 FF	Send Address Set command and IF_Clear command using broadcast before starting communication.
IF_Clear	Broadcast	88 01 00 01 FF	
CommandCancel		8x 2p FF	p: Socket No. (= 1 or 2)
CAM_Power	On	8x 01 04 00 02 FF	Power ON/OFF
	Off (Standby)	8x 01 04 00 03 FF	
CAM_Zoom	Stop	8x 01 04 07 00 FF	
	Tele (Standard)	8x 01 04 07 02 FF	
	Wide (Standard)	8x 01 04 07 03 FF	
	Tele (Variable)	8x 01 04 07 2p FF	p = Speed parameter, 0 (Low) to 7 (High), 8 steps
	Wide (Variable)	8x 01 04 07 3p FF	
	Direct	8x 01 04 47 0p 0q 0r 0s FF	pqrs: Zoom Position Optical zoom: 0000 (wide) to 4000 (tele) Digital zoom: 4000 (×1) to 7000 (×4)
	D-Zoom On	8x 01 04 06 02 FF	Digital zoom ON/OFF
	D-Zoom Off	8x 01 04 06 03 FF	
CAM_ZoomFocus	Direct	8x 01 04 47 0p 0q 0r 0s 0t 0u 0v 0w FF	pqrs: Zoom Position tuvw: Focus Position
CAM_Focus	Stop	8x 01 04 08 00 FF	Focus control
	Far (Standard)	8x 01 04 08 02 FF	
	Near (Standard)	8x 01 04 08 03 FF	
	Far (Variable)	8x 01 04 08 2p FF	p = Speed parameter, 0 (Low) to 7 (High), 8 steps
	Near (Variable)	8x 01 04 08 3p FF	
	Direct	8x 01 04 48 0p 0q 0r 0s FF	pqrs: Focus Position 1000 (∞) to C000 (1 cm)
	Auto Focus	8x 01 04 38 02 FF	AF ON/OFF
	Manual Focus	8x 01 04 38 03 FF	
	Auto/Manual	8x 01 04 38 10 FF	
	One Push Trigger	8x 01 04 18 01 FF	One push AF trigger
	Infinity	8x 01 04 18 02 FF	Forced infinity
	AF Sens High	8x 01 04 58 02 FF	AF sensitivity High/Low
	AF Sens Low	8x 01 04 58 03 FF	
	Near Limit	8x 01 04 28 0p 0q 0r 0s FF	pqrs: Focus Near Limit Position 1000 (∞) to C000 (1 cm)
CAM_WB	Auto	8x 01 04 35 00 FF	Normal Auto
	Indoor	8x 01 04 35 01 FF	Indoor mode
	Outdoor	8x 01 04 35 02 FF	Outdoor mode
	One Push WB	8x 01 04 35 03 FF	One push WB mode
	ATW	8x 01 04 35 04 FF	Auto tracing white balance
	Manual	8x 01 04 35 05 FF	Manual control mode
	One Push Trigger	8x 01 04 10 05 FF	One push WB trigger
CAM_RGain	Reset	8x 01 04 03 00 FF	Manual control of R Gain
	Up	8x 01 04 03 02 FF	
	Down	8x 01 04 03 03 FF	
	Direct	8x 01 04 43 0p 0q 0r 0s FF	pqrs: R Gain 0000 to 00FF, 256 steps
CAM_BGain	Reset	8x 01 04 04 00 FF	Manual control of B Gain
	Up	8x 01 04 04 02 FF	
	Down	8x 01 04 04 03 FF	
	Direct	8x 01 04 44 0p 0q 0r 0s FF	pqrs: B Gain 0000 to 00FF, 256 steps

COMMAND LIST

FCB-IX Series Command List (2/4)

Command Set	Command	Command Packet	Comments
CAM_AE	Full Auto	8x 01 04 39 00 FF	Automatic exposure mode
	Manual	8x 01 04 39 03 FF	Manual control mode
	Shutter Priority	8x 01 04 39 0A FF	Shutter priority automatic exposure mode
	Iris Priority	8x 01 04 39 0B FF	Iris priority automatic exposure mode
	Gain Priority	8x 01 04 39 0C FF	Gain priority automatic exposure mode
	Bright	8x 01 04 39 0D FF	Bright mode (Manual control)
	Shutter Auto	8x 01 04 39 1A FF	Automatic shutter mode
	Iris Auto	8x 01 04 39 1B FF	Automatic iris mode
	Gain Auto	8x 01 04 39 1C FF	Automatic gain mode
CAM_SlowShutter	Auto	8x 01 04 5A 02 FF	Slow shutter Auto/Manual
	Manual	8x 01 04 5A 03 FF	
CAM_Shutter	Reset	8x 01 04 0A 00 FF	Shutter setting
	Up	8x 01 04 0A 02 FF	
	Down	8x 01 04 0A 03 FF	
	Direct	8x 01 04 4A 0p 0q 0r 0s FF	pqrs: Shutter Position 0000 (NTSC 1/4, PAL 1/3) to 0013 (1/10000 sec.), 20 steps
CAM_Iris	Reset	8x 01 04 0B 00 FF	Iris setting
	Up	8x 01 04 0B 02 FF	
	Down	8x 01 04 0B 03 FF	
	Direct	8x 01 04 4B 0p 0q 0r 0s FF	pqrs: Iris Position 0000 (close) to 0011 (F1.4), 18 steps
CAM_Gain	Reset	8x 01 04 0C 00 FF	Gain setting
	Up	8x 01 04 0C 02 FF	
	Down	8x 01 04 0C 03 FF	
	Direct	8x 01 04 4C 0p 0q 0r 0s FF	pqrs: Gain Position 0000 (–3 dB) to 0007 (+18 dB), 8 steps
CAM_Bright	Reset	8x 01 04 0D 00 FF	Bright setting
	Up	8x 01 04 0D 02 FF	
	Down	8x 01 04 0D 03 FF	
	Direct	8x 01 04 4D 0p 0q 0r 0s FF	pqrs: Bright Position 0000 (close, 0 dB) to 0017 (F1.4, +18 dB), 24 steps at 3 dB
CAM_ExpComp	On	8x 01 04 3E 02 FF	Exposure compensation ON/OFF
	Off	8x 01 04 3E 03 FF	
	Reset	8x 01 04 0E 00 FF	Exposure compensation amount setting
	Up	8x 01 04 0E 02 FF	
	Down	8x 01 04 0E 03 FF	
	Direct	8x 01 04 4E 0p 0q 0r 0s FF	pqrs: ExpComp Position 0000 to 000E, 15 steps at 1.5 dB
CAM_BackLight	On	8x 01 04 33 02 FF	Back light compensation ON/OFF
	Off	8x 01 04 33 03 FF	
CAM_Aperture	Reset	8x 01 04 02 00 FF	Aperture control
	Up	8x 01 04 02 02 FF	
	Down	8x 01 04 02 03 FF	
	Direct	8x 01 04 42 0p 0q 0r 0s FF	pqrs: Aperture Gain 0000 to 000F, 16 steps, Initial value: 5
CAM_ZeroLuxShot	On	8x 01 04 01 02 FF	0 lx shot ON/OFF
	Off	8x 01 04 01 03 FF	

COMMAND LIST

FCB-IX Series Command List (3/4)

Command Set	Command	Command Packet	Comments
CAM_IR_Light	On	8x 01 04 31 02 FF	IR LED ON/OFF (valid in 0 lx shot mode)
	Off	8x 01 04 31 03 FF	
CAM_Wide	Off	8x 01 04 60 00 FF	Wide mode setting
	Cinema	8x 01 04 60 01 FF	
	16 : 9 Full	8x 01 04 60 02 FF	
CAM_LR_Reverse	On	8x 01 04 61 02 FF	Mirror image ON/OFF
	Off	8x 01 04 61 03 FF	
CAM_Freeze	On	8x 01 04 62 02 FF	Still image ON/OFF
	Off	8x 01 04 62 03 FF	
CAM_PictureEffect	Off	8x 01 04 63 00 FF	Picture effect setting
	Pastel	8x 01 04 63 01 FF	
	Neg.Art	8x 01 04 63 02 FF	
	Sepia	8x 01 04 63 03 FF	
	B&W	8x 01 04 63 04 FF	
	Solarize	8x 01 04 63 05 FF	
	Mosaic	8x 01 04 63 06 FF	
	SLIM	8x 01 04 63 07 FF	
	Stretch	8x 01 04 63 08 FF	
CAM_DigitalEffect	Off	8x 01 04 64 00 FF	Digital effect setting
	Still	8x 01 04 64 01 FF	
	Flash	8x 01 04 64 02 FF	
	Lumi.	8x 01 04 64 03 FF	
	Trail	8x 01 04 64 04 FF	
	Effect Level	8x 01 04 65 pp FF	pp: Effect level 00 to 18
CAM_Memory	Reset	8x 01 04 3F 00 0p FF	p: Memory number (= 0 to 5)
	Set	8x 01 04 3F 01 0p FF	
	Recall	8x 01 04 3F 02 0p FF	
CAM_Display	On	8x 01 04 15 02 FF (8x 01 06 06 02 FF)	Display ON/OFF
	Off	8x 01 04 15 03 FF (8x 01 06 06 03 FF)	
	On/Off	8x 01 04 15 10 FF (8x 01 06 06 10 FF)	
CAM_Date/TimeSet		8x 01 04 70 0m 0n 0p 0q 0r 0s 0t 0u 0v 0w FF (8x 01 07 29 0m 0n 0p 0q 0r 0s 0t 0u 0v 0w FF)	mn: Year (19mn, 20mn), pq: Month, rs: Day, tu: Hour, vw: Minute
CAM_DateDisplay	On	8x 01 04 71 02 FF (8x 01 07 2A 02 FF)	Date display ON/OFF
	Off	8x 01 04 71 03 FF (8x 01 07 2A 03 FF)	
CAM_TimeDisplay	On	8x 01 04 72 02 FF (8x 01 07 2B 02 FF)	Time display ON/OFF
	Off	8x 01 04 72 03 FF (8x 01 07 2B 03 FF)	

COMMAND LIST

FCB-IX Series Command List (4/4)

Command Set	Command	Command Packet	Comments
CAM_Title	Title Set1	8x 01 04 73 00 mm nn pp qq 00 00 00 00 00 FF	mm: Vposition 00 to 0A, nn: Hposition 00 to 17 pp: Color 00 to 06, qq: Blink 00 or 01
	Title Set2	8x 01 04 73 01 mm nn pp qq rr ss tt uu vv ww FF	mnpqrstuvw: Setting of display characters (1st to 10th character)
	Title Set3	8x 01 04 73 02 mm nn pp qq rr ss tt uu vv ww FF	mnpqrstuvw: Setting of display characters (11th to 20th character)
	Title Clear	8x 01 04 74 00 FF	Title setting clear
	On	8x 01 04 74 02 FF	Title display ON/OFF
	Off	8x 01 04 74 03 FF	
CAM_KeyLock	Off	8x 01 04 17 00 FF	Key lock ON/OFF
	On	8x 01 04 17 02 FF	
CAM_IDWrite		8x 01 04 22 0p 0q 0r 0s FF	pqrs: Camera ID (= 0000 to FFFF)

COMMAND LIST

FCB-IX Series Inquiry Command List (1/2)

Inquiry Command	Command Packet	Inquiry Packet	Comments
CAM_PowerInq	8x 09 04 00 FF	y0 50 02 FF	On
		y0 50 03 FF	Off (Standby)
CAM_DZoomModeInq	8x 09 04 06 FF	y0 50 02 FF	D-Zoom On
		y0 50 03 FF	D-Zoom Off
CAM_ZoomPosInq	8x 09 04 47 FF	y0 50 0p 0q 0r 0s FF	pqrs: Zoom Position
CAM_FocusModeInq	8x 09 04 38 FF	y0 50 02 FF	Auto Focus
		y0 50 03 FF	Manual Focus
CAM_FocusPosInq	8x 09 04 48 FF	y0 50 0p 0q 0r 0s FF	pqrs: Focus Position
CAM_AFModeInq	8x 09 04 58 FF	y0 50 02 FF	AF Sens High
		y0 50 03 FF	AF Sens Low
CAM_FocusNearLimitInq	8x 09 04 28 FF	y0 50 0p 0q 0r 0s FF	pqrs: Focus Near Limit Position
CAM_WBModeInq	8x 09 04 35 FF	y0 50 00 FF	Auto
		y0 50 01 FF	Indoor
		y0 50 02 FF	Outdoor
		y0 50 03 FF	One Push WB
		y0 50 04 FF	ATW
		y0 50 05 FF	Manual
CAM_RGainInq	8x 09 04 43 FF	y0 50 0p 0q 0r 0s FF	pqrs: R Gain
CAM_BGainInq	8x 09 04 44 FF	y0 50 0p 0q 0r 0s FF	pqrs: B Gain
CAM_AEModeInq	8x 09 04 39 FF	y0 50 00 FF	Full Auto
		y0 50 03 FF	Manual
		y0 50 0A FF	Shutter Priority
		y0 50 0B FF	Iris Priority
		y0 50 0C FF	Gain Priority
		y0 50 0D FF	Bright
		y0 50 1A FF	Shutter Auto
		y0 50 1B FF	Iris Auto
		y0 50 1C FF	Gain Auto
CAM_SlowShutterModeInq	8x 09 04 5A FF	y0 50 02 FF	Auto
		y0 50 03 FF	Manual
CAM_ShutterPosInq	8x 09 04 4A FF	y0 50 0p 0q 0r 0s FF	pqrs: Shutter Position
CAM_IrisPosInq	8x 09 04 4B FF	y0 50 0p 0q 0r 0s FF	pqrs: Iris Position
CAM_GainPosInq	8x 09 04 4C FF	y0 50 0p 0q 0r 0s FF	pqrs: Gain Position
CAM_BrightPosInq	8x 09 04 4D FF	y0 50 0p 0q 0r 0s FF	pqrs: Bright Position
CAM_ExpCompModeInq	8x 09 04 3E FF	y0 50 02 FF	On
		y0 50 03 FF	Off
CAM_ExpCompPosInq	8x 09 04 4E FF	y0 50 0p 0q 0r 0s FF	pqrs: ExpComp Position
CAM_BackLightModeInq	8x 09 04 33 FF	y0 50 02 FF	On
		y0 50 03 FF	Off
CAM_ApertureInq	8x 09 04 42 FF	y0 50 0p 0q 0r 0s FF	pqrs: Aperture Gain
CAM_ZeroLuxShotModeInq	8x 09 04 01 FF	y0 50 02 FF	On
		y0 50 03 FF	Off
CAM_IRLightModeInq	8x 09 04 31 FF	y0 50 02 FF	On
		y0 50 03 FF	Off
CAM_WideModeInq	8x 09 04 60 FF	y0 50 00 FF	Off
		y0 50 01 FF	Cinema
		y0 50 02 FF	16:9 Full

COMMAND LIST

FCB-IX Series Inquiry Command List (2/2)

Inquiry Command	Command Packet	Inquiry Packet	Comments
CAM_LR_ReverseModeInq	8x 09 04 61 FF	y0 50 02 FF	On
		y0 50 03 FF	Off
CAM_FreezeModeInq	8x 09 04 62 FF	y0 50 02 FF	On
		y0 50 03 FF	Off
CAM_PictureEffectModeInq	8x 09 04 63 FF	y0 50 00 FF	Off
		y0 50 01 FF	Pastel
		y0 50 02 FF	Neg. Art
		y0 50 03 FF	Sepia
		y0 50 04 FF	B & W
		y0 50 05 FF	Solarize
		y0 50 06 FF	Mosaic
		y0 50 07 FF	SLIM
		y0 50 08 FF	Stretch
CAM_DigitalEffectModeInq	8x 09 04 64 FF	y0 50 00 FF	Off
		y0 50 01 FF	Still
		y0 50 02 FF	Flash
		y0 50 03 FF	Lumi.
		y0 50 04 FF	Trail
CAM_DigitalEffectLevelInq	8x 09 04 65 FF	y0 50 pp FF	pp: Effect Level
CAM_MemoryInq	8x 09 04 3F FF	y0 50 0p FF	p: Memory number last operated
CAM_DisplayModeInq	8x 09 04 15 FF	y0 50 02 FF	On
	(8x 09 06 06 FF)	y0 50 03 FF	Off
CAM_KeyLockInq	8x 09 04 17 FF	y0 50 00 FF	Off
		y0 50 02 FF	On
CAM_IDInq	8x 09 04 22 FF	y0 50 0p 0q 0r 0s FF	pqrs: Camera ID
CAM_DeviceTypeInq/ VersionInq	8x 09 00 02 FF	y0 50 00 20 mn pq rs tu vw FF	mnpq: Model Code* rstu: ROM version vw: Socket Number (= 02)

* Model Code: FCB-IX Series = 0401

COMMAND LIST

FCB-IX Series Block Inquiry Command List

◇ Lens control system inquiry command (1/2) ..... Command Packet 8x 09 7E 7E 00 FF

<Inquiry Packet>

	7	↕	Destination Address
	6		
	5		
Packet	4		
0	3	↕	Source Address
	2		
	1		
	0		
	7	0	Completion Message (50h)
	6	1	
	5	0	
Packet	4	1	
1	3	0	
	2	0	
	1	0	
	0	0	
	7	0	
	6	0	
	5	0	
Packet	4	0	
2	3	↕	Zoom Position (HH)
	2		
	1		
	0		
	7	0	
	6	0	
	5	0	
Packet	4	0	
3	3	↕	Zoom Position (HL)
	2		
	1		
	0		
	7	0	
	6	0	
	5	0	
Packet	4	0	
4	3	↕	Zoom Position (LH)
	2		
	1		
	0		

	7	0	
	6	0	
	5	0	
Packet	4	0	
5	3	↕	Zoom Position (LL)
	2		
	1		
	0		
	7	0	
	6	0	
	5	0	
Packet	4	0	
6	3	↕	Focus Near Limit (H)
	2		
	1		
	0		
	7	0	
	6	0	
	5	0	
Packet	4	0	
7	3	↕	Focus Near Limit (L)
	2		
	1		
	0		
	7	0	
	6	0	
	5	0	
Packet	4	0	
8	3	↕	Focus Position (HH)
	2		
	1		
	0		
	7	0	
	6	0	
	5	0	
Packet	4	0	
9	3	↕	Focus Position (HL)
	2		
	1		
	0		

COMMAND LIST

◇ Lens control system inquiry command (2/2) ..... Command Packet 8x 09 7E 7E 00 FF

<Inquiry Packet>

	7	0
	6	0
	5	0
Packet	4	0
10	3	Focus Position (LH)
	2	
	1	
	0	
	7	0
	6	0
	5	0
Packet	4	0
11	3	Focus Position (LL)
	2	
	1	
	0	
	7	0
	6	0
	5	0
Packet	4	0
12	3	0
	2	Camera Memory Last Access Position
	1	
	0	
	7	0
	6	0
	5	0
Packet	4	0
13	3	0
	2	AF Sens (1: High, 0: Low)
	1	Digital Zoom (1: On, 0: Off)
	0	Focus Mode (1: Auto, 0: Manual)
	7	0
	6	0
	5	0
Packet	4	0
14	3	0
	2	Camera Memory Recall (1: Executing, 0: Stopped)
	1	Focus Command (1: Executing, 0: Stopped)
	0	Zoom Command (1: Executing, 0: Stopped)

	7	1 Terminator (FFh)
	6	1
	5	1
Packet	4	1
15	3	1
	2	1
	1	1
	0	1

COMMAND LIST

◇ Camera control system inquiry command (1/2) ..... Command Packet 8x 09 7E 7E 01 FF

<Inquiry Packet>

	7		Destination Address
	6		
	5		
Packet	4		
0	3		Source Address
	2		
	1		
	0		
	7	0	Completion Message (50h)
	6	1	
	5	0	
Packet	4	1	
1	3	0	
	2	0	
	1	0	
	0	0	
	7	0	
	6	0	
	5	0	
Packet	4	0	
2	3		R Gain (H)
	2		
	1		
	0		
	7	0	
	6	0	
	5	0	
Packet	4	0	
3	3		R Gain (L)
	2		
	1		
	0		
	7	0	
	6	0	
	5	0	
Packet	4	0	
4	3		B Gain (H)
	2		
	1		
	0		

	7	0	
	6	0	
	5	0	
Packet	4	0	
5	3		B Gain (L)
	2		
	1		
	0		
	7	0	
	6	0	
	5	0	
Packet	4	0	
6	3	0	
	2		WB Mode
	1		
	0		
	7	0	
	6	0	
	5	0	
Packet	4	0	
7	3		Aperture Gain
	2		
	1		
	0		
	7	0	
	6	0	
	5	0	
Packet	4		Exposure Mode
8	3		
	2		
	1		
	0		
	7	0	
	6		Gain Command (1: Valid, 0: Invalid)
	5		Iris Command (1: Valid, 0: Invalid)
Packet	4		Shutter Command (1: Valid, 0: Invalid)
9	3		Bright Command (1: Valid, 0: Invalid)
	2		Back Light (1: On, 0: Off)
	1		Exposure Comp. (1: On, 0: Off)
	0		Slow Shutter (1: Auto, 0: Manual)

COMMAND LIST

◇ Camera control system inquiry command (2/2) ..... Command Packet 8x 09 7E 7E 01 FF

<Inquiry Packet>

	7	0
	6	0
	5	0
Packet	4	Shutter Position
10	3	
	2	
	1	
	0	
	7	0
	6	0
	5	0
Packet	4	0
11	3	Iris Position
	2	
	1	
	0	
	7	0
	6	0
	5	0
Packet	4	0
12	3	0
	2	Gain Position
	1	
	0	
	7	0
	6	0
	5	0
Packet	4	Bright Position
13	3	
	2	
	1	
	0	
	7	0
	6	0
	5	0
Packet	4	0
14	3	Exposure Comp. Position
	2	
	1	
	0	

	7	1 Terminator (FFh)
	6	1
	5	1
Packet	4	1
15	3	1
	2	1
	1	1
	0	1

COMMAND LIST

◇ Other inquiry commands (1/2).....Command Packet 8x 09 7E 7E 02 FF

<Inquiry Packet>

	7	↑	Destination Address
	6		
	5		
Packet	4		
0	3	↑	Source Address
	2		
	1		
	0	↓	
	7	0	Completion Message (50h)
	6	1	
	5	0	
Packet	4	1	
1	3	0	
	2	0	
	1	0	
	0	0	
	7	0	
	6	0	
	5	0	
Packet	4	0	
2	3	0	
	2	0	
	1	Key Lock (1: On, 0: Off)	
	0	Power (1: On, 0: Off)	
	7	0	
	6	0	
	5	IR Light (1: On, 0: Off)	
Packet	4	Zero Lux Shot (1: On, 0: Off)	
3	3	Freeze (1: On, 0: Off)	
	2	LR Reverse (1: On, 0: Off)	
	1	Wide 16:9 Full (1: On, 0: Off)	
	0	Wide Cinema (1: On, 0: Off)	
	7	0	
	6	0	
	5	0	
Packet	4	0	
4	3	Title Display (1: On, 0: Off)	
	2	Display (1: On, 0: Off)	
	1	Time Display (1: On, 0: Off)	
	0	Date Display (1: On, 0: Off)	

	7	0	
	6	0	
	5	0	
Packet	4	0	
5	3	0	
	2	↑	Picture Effect Mode
	1		
	0	↓	
	7	0	
	6	0	
	5	0	
Packet	4	0	
6	3	0	
	2	↑	Digital Effect Mode
	1		
	0	↓	
	7	0	
	6	0	
	5	0	
Packet	4	↑	Digital Effect Level
7	3		
	2		
	1		
	0	↓	
	7	0	
	6	0	
	5	0	
Packet	4	0	
8	3	↑	Camera ID (HH)
	2		
	1		
	0	↓	
	7	0	
	6	0	
	5	0	
Packet	4	0	
9	3	↑	Camera ID (HL)
	2		
	1		
	0	↓	

COMMAND LIST

◇ Other inquiry commands (2/2).....Command Packet 8x 09 7E 7E 02 FF

<Inquiry Packet>

	7	0
	6	0
	5	0
Packet	4	0
10	3	Camera ID (LH)
	2	
	1	
	0	
	7	0
	6	0
	5	0
Packet	4	0
11	3	Camera ID (LL)
	2	
	1	
	0	
	7	0
	6	0
	5	0
Packet	4	0
12	3	0
	2	Zero Lux Shot (1: Provided, 0: Not provided)
	1	0
	0	System (1: PAL, 0: NTSC)
	7	0
	6	0
	5	0
Packet	4	0
13	3	0
	2	0
	1	0
	0	0
	7	0
	6	0
	5	0
Packet	4	0
14	3	0
	2	0
	1	0
	0	0

	7	1 Terminator (FFh)
	6	1
	5	1
Packet	4	1
15	3	1
	2	1
	1	1
	0	1

COMMAND LIST

VISCA™ Command Setting Value

◇ Exposure control

		NTSC	PAL
Shutter Speed	13	10000	10000
	12	6000	6000
	11	4000	3500
	10	3000	2500
	0F	2000	1750
	0E	1500	1250
	0D	1000	1000
	0C	725	600
	0B	500	425
	0A	350	300
	09	250	215
	08	180	150
	07	125	120
	06	100	100
	05	90	75
	04	60	50
	03	30	25
	02	15	12
	01	8	6
	00	4	3
Iris	11	F1.4	
	10	F1.6	
	0F	F2	
	0E	F2.4	
	0D	F2.8	
	0C	F3.4	
	0B	F4	
	0A	F4.8	
	09	F5.6	
	08	F6.8	
	07	F8	
	06	F9.6	
	05	F11	
	04	F14	
	03	F16	
	02	F19	
	01	F22	
	00	CLOSE	
Gain	07	18 dB	
	06	15 dB	
	05	12 dB	
	04	9 dB	
	03	6 dB	
	02	3 dB	
	01	0 dB	
	00	–3 dB	

Bright	17	F1.4	18 dB
	16	F1.4	15 dB
	15	F1.4	12 dB
	14	F1.4	9 dB
	13	F1.4	6 dB
	12	F1.4	3 dB
	11	F1.4	0 dB
	10	F1.6	0 dB
	0F	F2	0 dB
	0E	F2.4	0 dB
	0D	F2.8	0 dB
	0C	F3.4	0 dB
	0B	F4	0 dB
	0A	F4.8	0 dB
	09	F5.6	0 dB
	08	F6.8	0 dB
	07	F8	0 dB
	06	F9.6	0 dB
	05	F11	0 dB
	04	F14	0 dB
	03	F16	0 dB
	02	F19	0 dB
	01	F22	0 dB
	00	CLOSE	0 dB
Exposure Comp.	0E	7	10.5 dB
	0D	6	9 dB
	0C	5	7.5 dB
	0B	4	6 dB
	0A	3	4.5 dB
	09	2	3 dB
	08	1	1.5 dB
	07	0	0 dB
	06	–1	–1.5 dB
	05	–2	–3 dB
	04	–3	–4.5 dB
	03	–4	–6 dB
	02	–5	–7.5 dB
	01	–6	–9 dB
	00	–7	–10.5 dB

COMMAND LIST

◇ Lens control

Zoom Position	0000 to 4000 to 7000 Wide end Optical Tele end Digital Tele end	
Focus Position	1000 to C000 Far end Near end	
Focus Near Limit	1000 : Over Infinity 2000 : 8 m 3000 : 3.5 m 4000 : 2 m 5000 : 1.4 m 6000 : 1 m 7000 : 80 cm 8000 : 29 cm 9000 : 10 cm A000 : 4.7 cm B000 : 2.3 cm C000 : 1 cm	As the distances on the left will differ due to temperature characteristics, etc., use as approximate values. * The lower 1 byte is fixed at 00.

◇ Others

R, B Gain	00 to FF
Aperture	00 to 0F
Digital Effect Level	00 to 18

◇ Title setting

Vposition	00 to 0A	
Hposition	00 to 17	
Blink	00: Does not blink	
	01: Blinks	
Color	00	White
	01	Yellow
	02	Violet
	03	Red
	04	Cyan
	05	Green
	06	Blue

◇ Title characters

Table of character codes

00	01	02	03	04	05	06	07
A	B	C	D	E	F	G	H
08	09	0a	0b	0c	0d	0e	0f
I	J	K	L	M	N	O	P
10	11	12	13	14	15	16	17
Q	R	S	T	U	V	W	X
18	19	1a	1b	1c	1d	1e	1f
Y	Z	&		?	!	1	2
20	21	22	23	24	25	26	27
3	4	5	6	7	8	9	0
28	29	2a	2b	2c	2d	2e	2f
À	È	Ì	Ò	Ù	Á	É	Í
30	31	32	33	34	35	36	37
Ó	Ú	Â	Ê	Ô	AE	OE	Ã
38	39	3a	3b	3c	3d	3e	3f
Õ	Ñ	Ç	β	Ä	Ï	Ö	Ü
40	41	42	43	44	45	46	47
Å	$	₣	¥	DM	£	¿	¡
48	49	4a	4b	4c	4d	4e	4f
ϕ	”	:	’	.	,	/	–

MEMO

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